PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ipb/128988	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/DK 03/00235	International filing date *(day/month/year)* 09.04.2003	Priority date *(day/month/year)* 22.04.2002
International Patent Classification (IPC) or both national classification and IPC B04B1/20		
Applicant ALFA LAVAL COPENHAGEN A/S et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
08.10.2003	16.07.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Strodel, K-H Telephone No. +49 89 2399-7899

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/DK 03/00235

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-10 as published

Claims, Numbers

1-10 as published

Drawings, Sheets

1/3-3/3 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-10
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-10
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Document **WO 97 22411 A1**, which is considered to represent the most relevant state of the art, discloses (cf. page 8, line 1 to page 9, line 6) a decanter centrifuge from which the subject-matter of claim 1 differs in that the screw conveyor has a bigger nominal transport speed in the transition part than in the separation part immediately before the transition part, the change of the nominal transport speed of the screw from the nominal transport speed in the separation part immediately before the transition part to the higher nominal transport speed in the transition part being established by a change of the screw pitch.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to reduce an accumulation of heavy phase caused by the baffle.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

WO 97 22411 A1 address to the same problem, however teaches to shape the baffle like a helical surface turning in the same direction as the conveyor screw in order to contribute to transporting the heavy phase. There is no hint with respect of a change of the screw pitch.
The teaching of **DE 29 07 318 A1** is a reduction of transport speed in the separation part compared to the transport speed in the discharge part by an increase of the screw pitch in direction towards the dischage in order to improve separation efficiency. However, as D2 lacks a baffle a different technical effect is to be expected.

The increase of nominal transport speed in the transition part by a change of the screw pith in decanter centrifuges is not known from the documents cited in the search report, nor is there any information to be found which would lead the skilled person to such a solution.

Claims 2-10 are dependent on claim 1 and as such also meet the requirements of the

PCT with respect to novelty and inventive step.

The claimed decanter centrifuge is applicable in the field of separation technology. Therefore the requirements of Article 33(4) PCT are fulfilled.